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Filed : December 14, 1999

voltage, which is higher than the first voltage, for transferring the charges from the collection region into a detection region.

### REMARKS

The Applicant wishes to thank Examiner Lee for the interview conducted on February 19, 2002 regarding the December 6, 2001 Office Action. The Examiner's comments were very helpful and are incorporated into amended Claim 1. In view of the amendments and the following arguments, Applicant respectfully requests reconsideration and allowance of Claims 1-11.

### Claim Rejections

In the December 6, 2001 Office Action, the Examiner rejects Claims 1 and 4-6 under 35 U.S.C. § 102(b) as being anticipated by Takemoto (U.S. Patent No. 4,148,048). Further, the Examiner rejects Claims 2, 3, 7 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Takemoto in view of Kuroda (U.S. Patent No. 4,498,013.) The Examiner also rejected Claims 9-11 under 35 U.S.C. §103(a) as being unpatentable over Takemoto in view of Hook (U.S. Patent No. 6,194,702). In view of the following comments, Applicant respectfully submits that independent Claim 1 as amended is allowable over the cited references. As dependent Claims 2-11 depend from Claim 1 as amended, Applicant submit that Claims 2-11 are patentable for the same reasons articulated hereinafter with respect to Claim 1 as amended, and because of the additional inventive features recited in the dependent claims. Applicant respectfully requests allowance of Claims 1-11 as amended.

Claim 1 has been amended to further define that the dual-purpose electrode is intended to be driven by a first voltage that causes an electrostatic potential which collects in an area of the collection region beneath the dual-purpose electrode charges generated by electromagnetic radiation. Further, the dual-purpose electrode is intended to be driven by a second voltage, which is higher than the first voltage, for transferring the charges from the collection region into a detection region. The specific changes to Claim 1 are shown on a separate set of pages attached hereto and entitled **VERSION WITH MARKINGS TO SHOW CHANGES MADE**, which follows the signature page of this Amendment. On this set of pages, the insertions are underlined while the deletions are struck through.

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Takemoto fails to disclose or suggest a pixel structure with such a dual-purpose electrode. Instead, Takemoto discloses in Figure 2 a conventional imaging device having a photodiode and a MOS-FET with a gate electrode 13. Upon incidence of light, electron-hole pairs are created in the n-type diffused layer 12 and the Si body 11, wherein the electrons flow into the n-type diffused layer 12 and are stored in the pn-junction capacitance 18 (col. 1, lines 59-64.) A positive scan pulse is then impressed on the gate electrode 13 and the electrons flow to the output terminal 8 (col. 1, lines 64-68.) The gate electrode 13 is impressed with only one voltage (i.e., the positive scan pulse.) No voltage is applied when the scan pulse is absent. The gate electrode 13 is therefore not a dual-purpose electrode as defined in Claim 1 as amended.

Therefore, Claim 1 as amended includes limitations that are not disclosed or suggested by Takemoto. The gate electrode 13 that is impressed with the scan pulse provides no suggestion for impressing two different voltages as defined in Claim 1 as amended. Claim 1 as amended is therefore patentable over Takemoto. Applicant respectfully requests the Examiner to withdraw the rejection over Takemoto and to pass Claim 1 as amended to allowance.

Kuroda and Hook also do not disclose or suggest a dual-purpose electrode as defined in Claim 1 as amended. Kuroda is silent as to the particularities of driving the V-CCD transfer electrode 6 and the transfer gate electrode 8. Similarly, Hook discloses two separate electrodes 24, 24'. Applicant submits that the electrodes disclosed in Kuroda and Hook are single-purpose electrodes.

Thus, even if Takemoto is combined with at least one of Kuroda and Hook, such a combination does not render the pixel structure of Claim 1 as amended obvious. Applicant respectfully submits that Claim 1 as amended is patentable in view of Takemoto, Kuroda and Hook and requests the Examiner to pass Claim 1 as amended to allowance.

## CONCLUSION

Applicant has endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the foregoing amendments and remarks, Applicant respectfully submits that Claims 1-11 are in condition for allowance and respectfully requests allowance of Claims 1-11. If the Examiner finds any remaining impediment to the prompt

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allowance of these claims that could be clarified with a telephone conference, the Examiner is respectfully requested to initiate the same with the undersigned.

Respectfully submitted,

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Dated: March 6, 2002

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

1. (Twice amended) An active or passive pixel structure comprising:
  - a semiconductor substrate with dopants of a first conductivity type at a first concentration density, and with an insulating layer at its surface;
  - a collection region with dopants of a second conductivity type which is opposite the first conductivity type at a second concentration density, formed in the surface region of the semiconductor substrate;
  - a dual-purpose electrode formed on the insulating layer, extending over both the surface of at least part of the collection region and over at least part of the substrate, the dual-purpose electrode being intended to be driven by a first voltage that causes an electrostatic potential which collects for collecting in an area of the collection region beneath the dual-purpose electrode charges generated by electromagnetic radiation and by a second voltage, which is higher than the first voltage, for transferring the charges from the collection region into a detection region.

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